

State Transportation Commission Workshop

System Preservation Goals

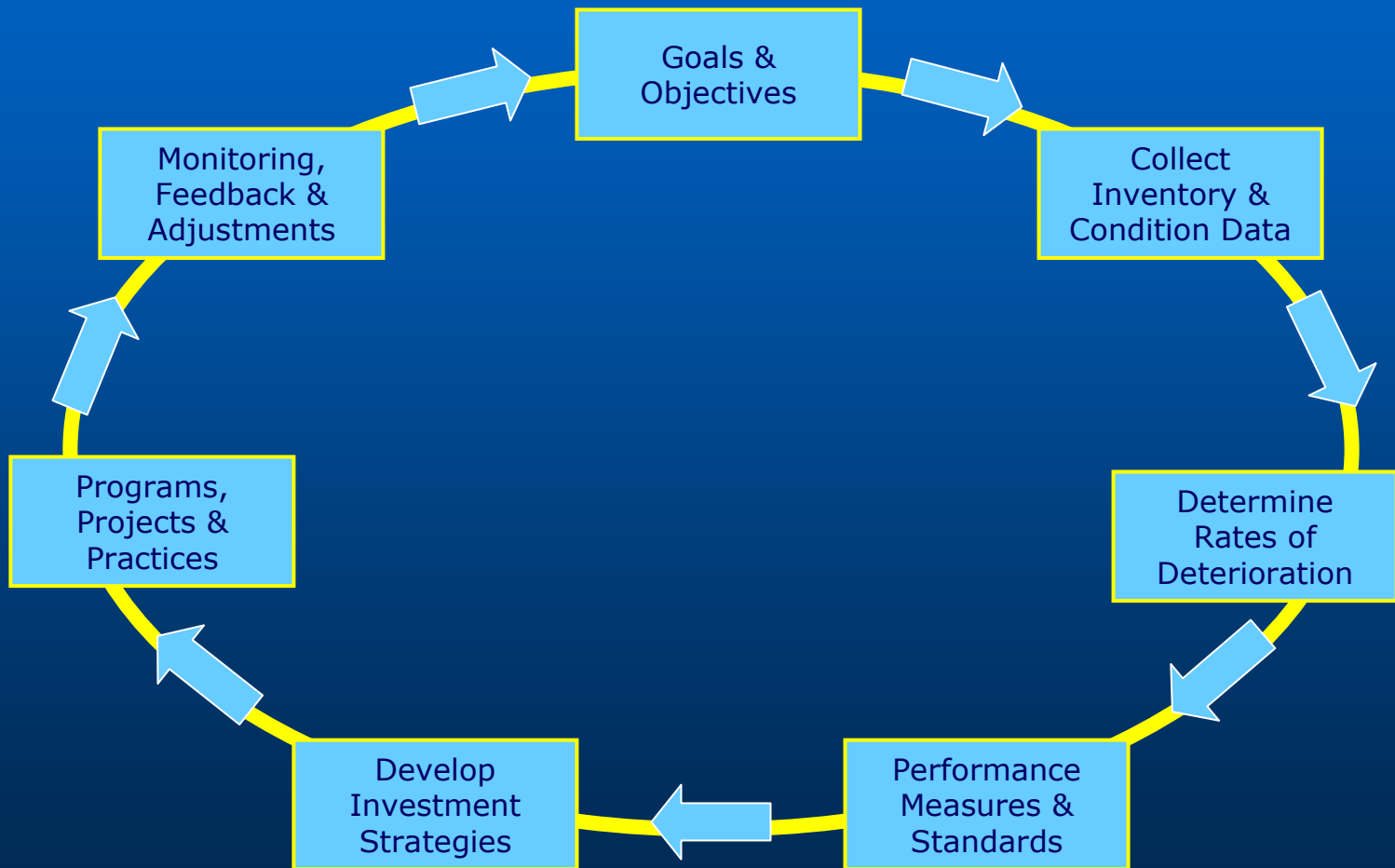
November 19, 2003

What We Hope to Accomplish Today

- Overview of how we are preserving the system
- Review of refinements and adjustments to road and bridge preservation program and tools
- Identify progress towards pavement and bridge goals
- Establish next steps

System Preservation

The Link to Asset Management



System Preservation

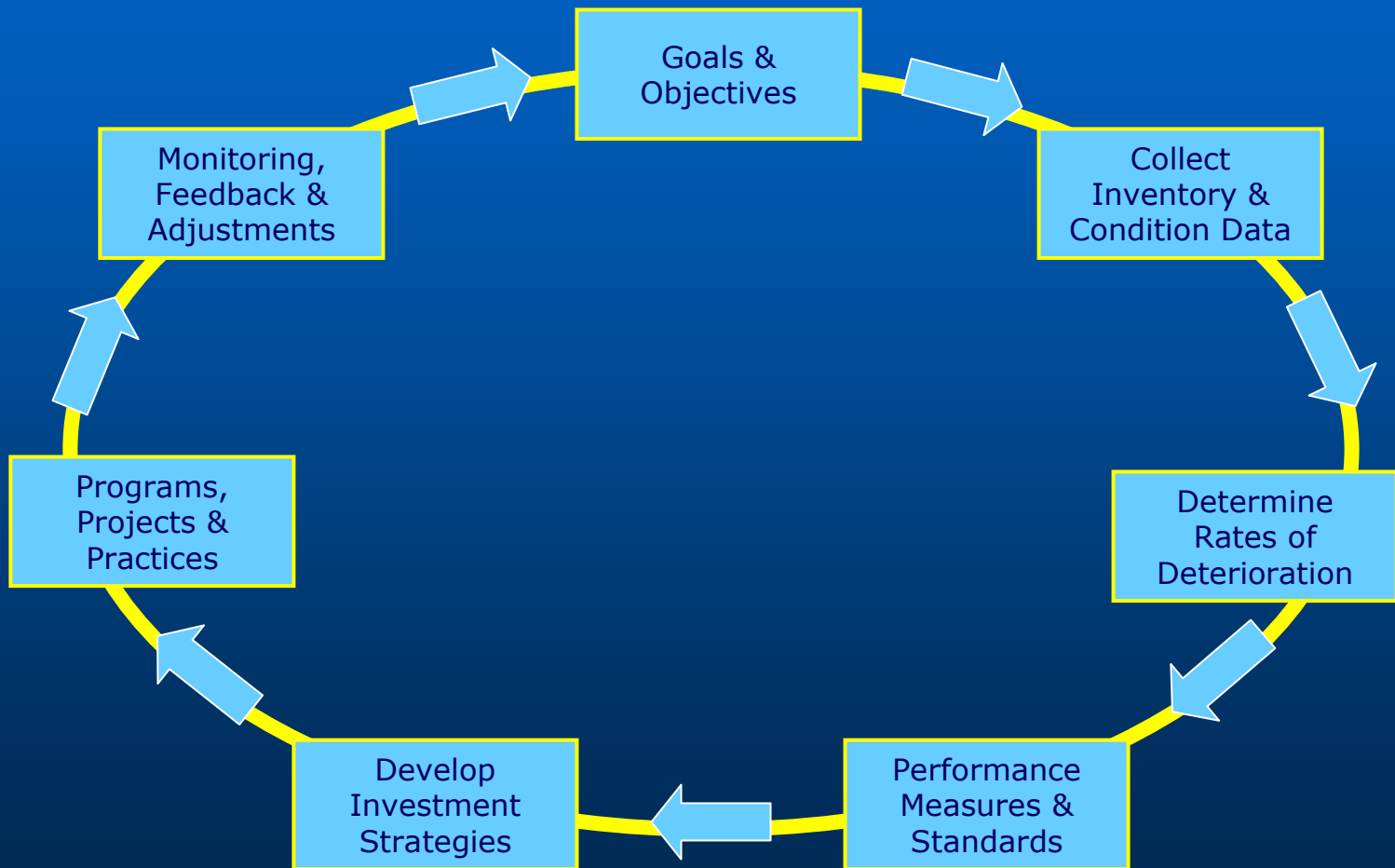
Benefits of the Asset Management Approach



- Strategic
- Proactive
- Integrated
- Systematic
- Interdisciplinary
- Advanced Systems
- Continuous Assessment
- Systems Approach
- Forward Thinking

System Preservation

Setting the Goals

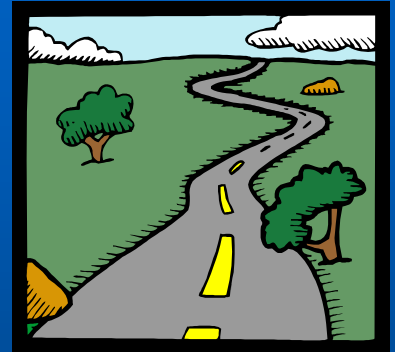


Preservation Goals

Roads

95% of Freeways in Good Condition by 2007.

85% of Non-freeways in Good Condition by 2007.



Bridges

95% of Freeway Bridges in Good Condition by 2008.

85% of Non-Freeway Bridges in Good Condition by 2008.



Road goal established in 1997;
Bridge Goal in 1998

Establishing the Goals Considerations & Context



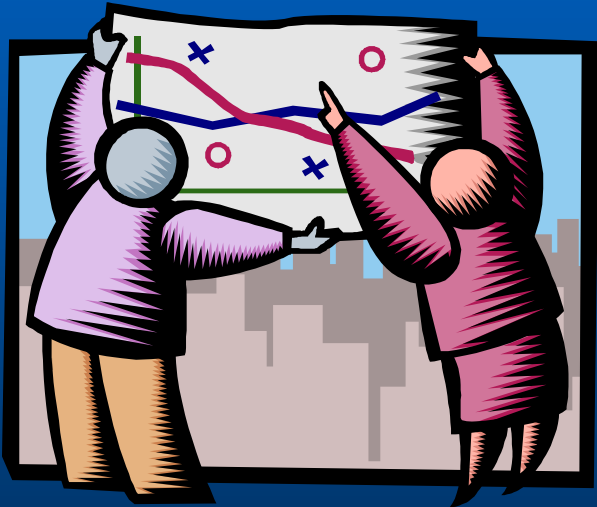
- Michigan's road and bridge trunkline system was in poor condition.
- #1 issue in news media
- Shift in focus from expanding the network to maintaining the existing system.

Establishing the Goals Considerations & Context

- Shift in organizational culture - customer oriented, results driven, and accountability.
- Provide a basis to support the need for additional revenue.



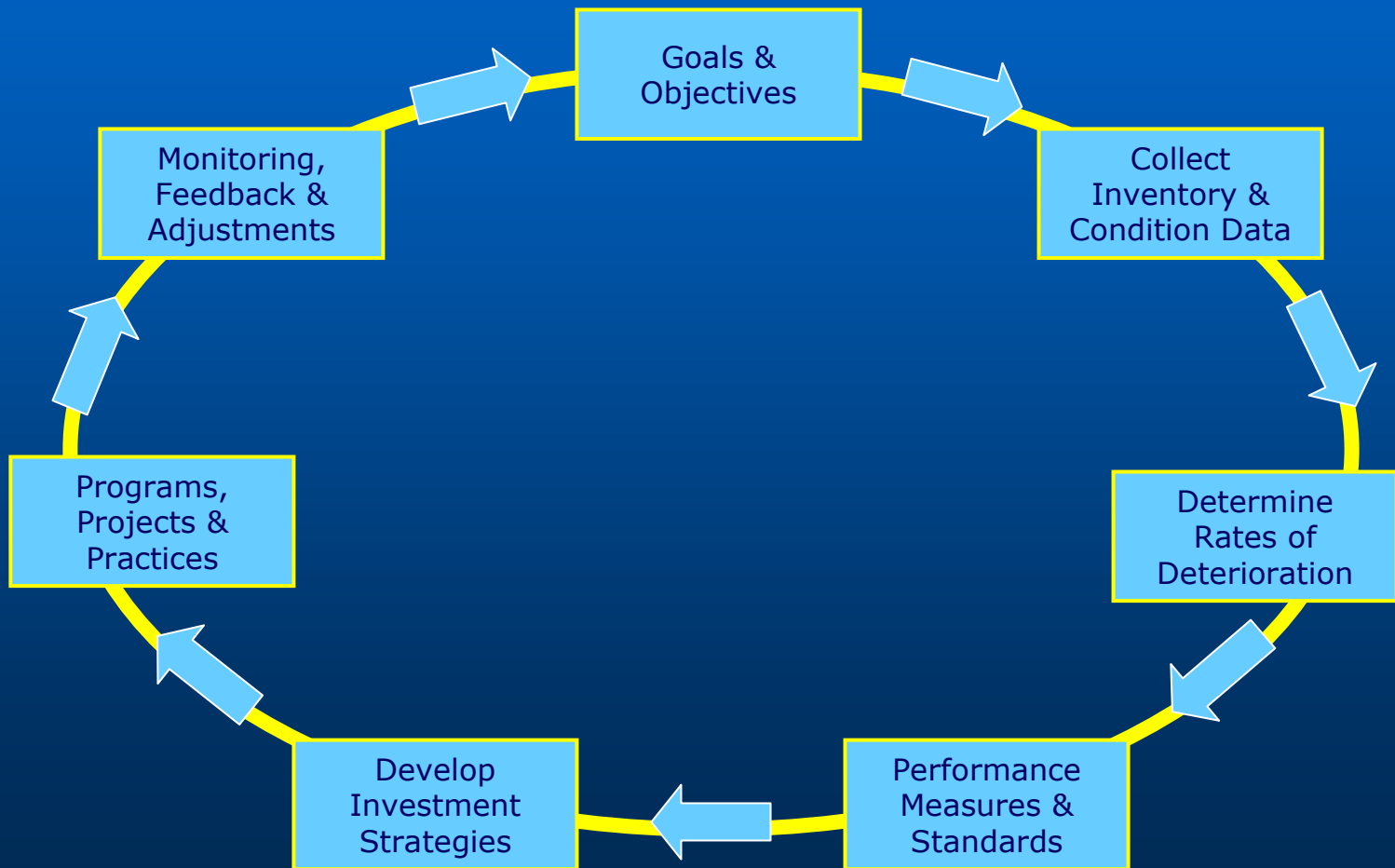
Establishing the Goals Considerations & Context



- MDOT took a strategic approach to managing the assets and programs.
- Objective: Long term improvement in the overall health of the system.

System Preservation

Collecting the Data



Pavement Inventory & Condition Data

- Annual Windshield Surveys
- Biennial Detailed Surveys
 - Surface Distress
 - Ride quality
 - Rutting
 - Friction



Bridge Inventory & Condition Data

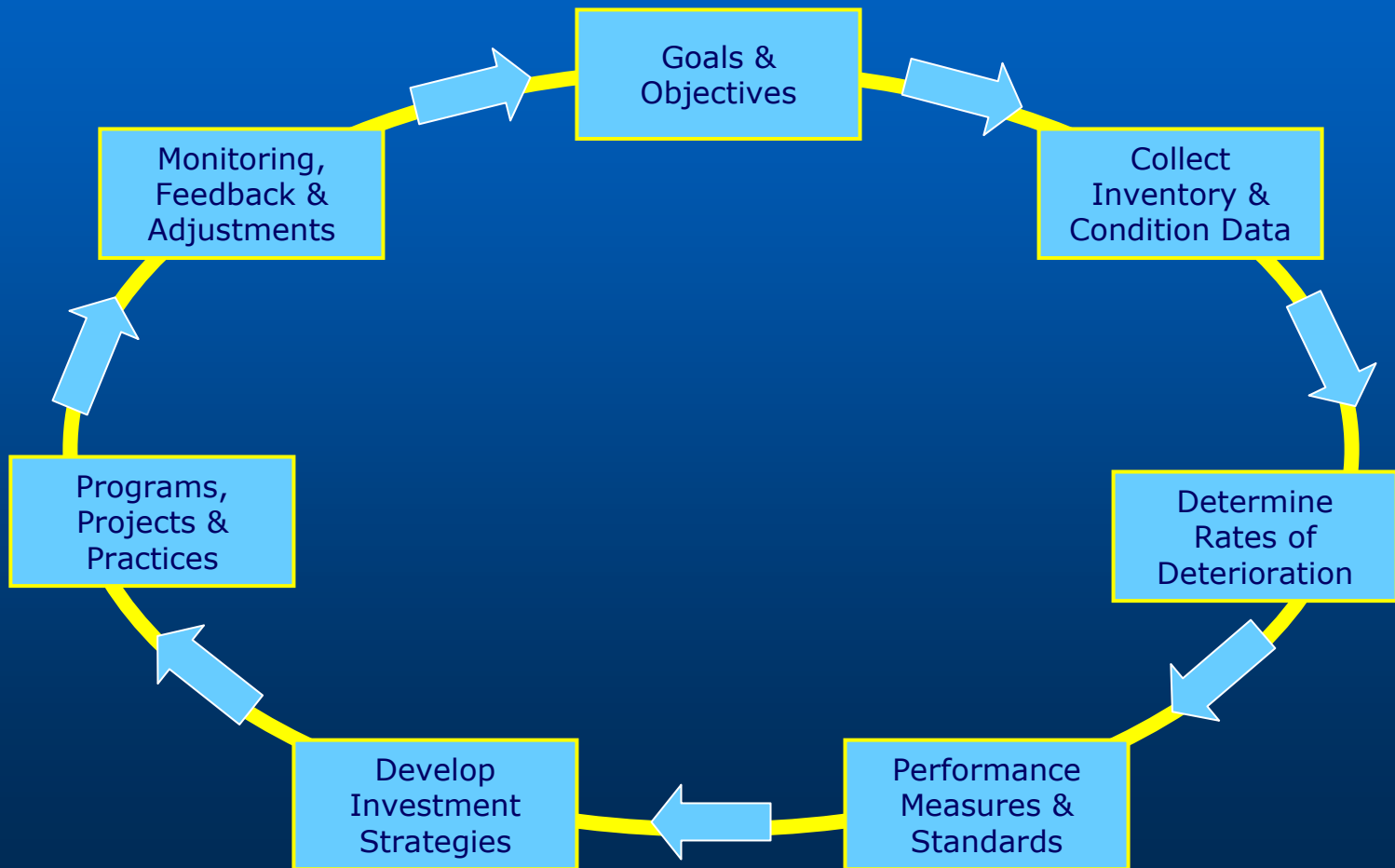
- Biennial rating using National Bridge Inspection Standards (NBIS)
 - Deck
 - Superstructure
 - Substructure

- PONTIS (Latin for Bridge)
 - Advanced analytical Tool used for bridge Network Management



System Preservation

Rates of Deterioration



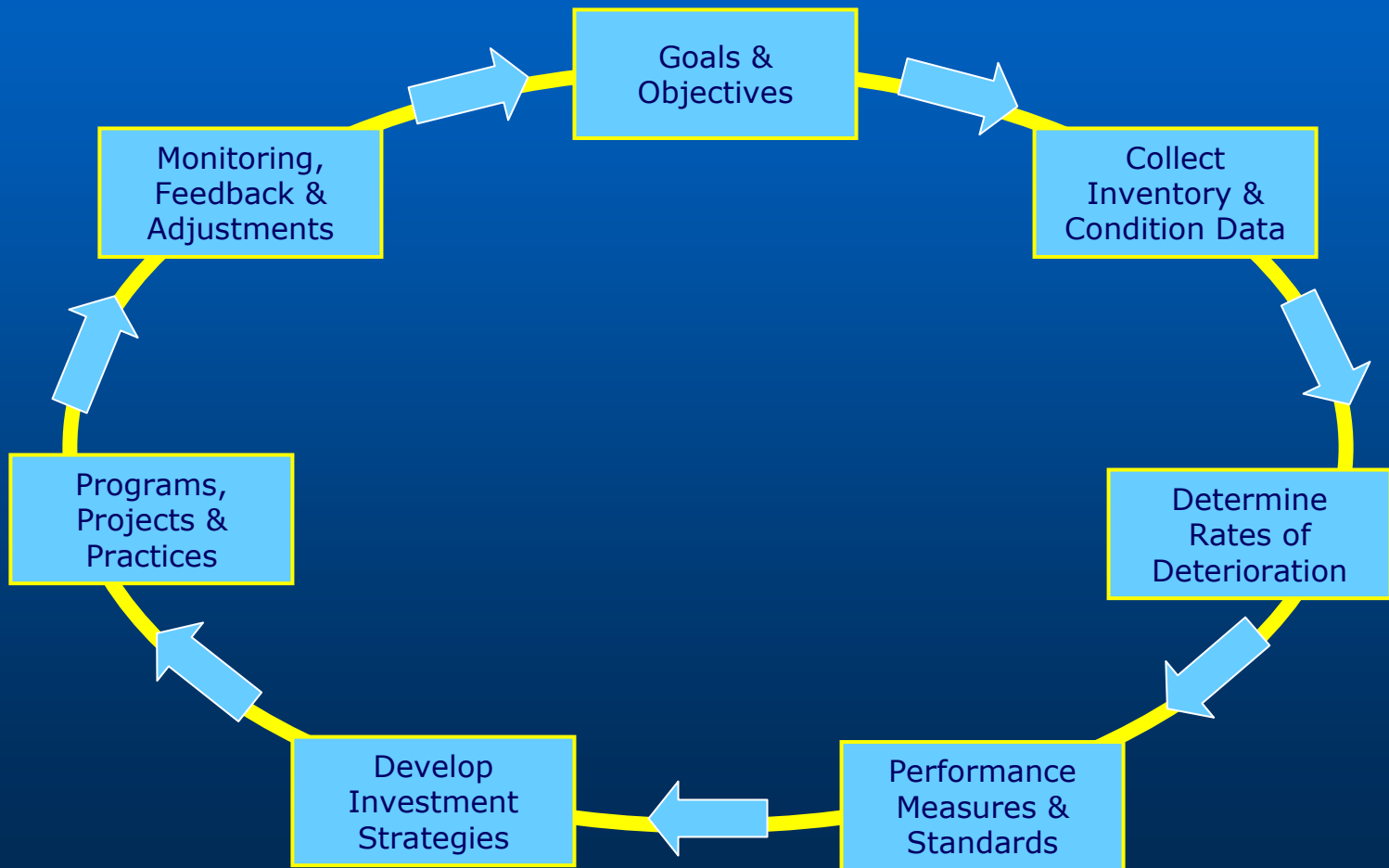
Determine Rates of Deterioration



- Analysis Step
- Essential in order to do Forecasting
- Primarily a manual task in past
- PaveMaPP Initiative will automate process
- PONTIS uses statistical methods to calculate bridge element deterioration rates

System Preservation

Performance Measures



Performance Measures



For Roads - Remaining Service Life (RSL)

- RSL is a measure of current condition and rate of deterioration
- RSL is a measure of how long before rehabilitation or reconstruction is needed
- RSL is an indicator for how long before it is no longer cost effective to maintain a pavement
- RSL is a good measure for internal purposes, but is hard to relate to public perception

Performance Measures

Rehabilitated 10 years ago.

Moderate surface distress.

10 years RSL.



Recently resurfaced.

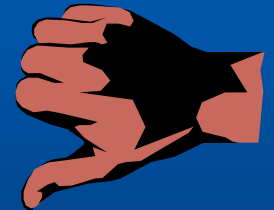
Negligible surface distress.

10 years RSL.



Performance Measures

- Good = Pavement with a high RSL
- Fair = Pavement with a moderate RSL
- Poor = Pavement with little or no RSL
- Some difficulty defining “fair”, so current “good” goal combines the good and “fair” pavement together

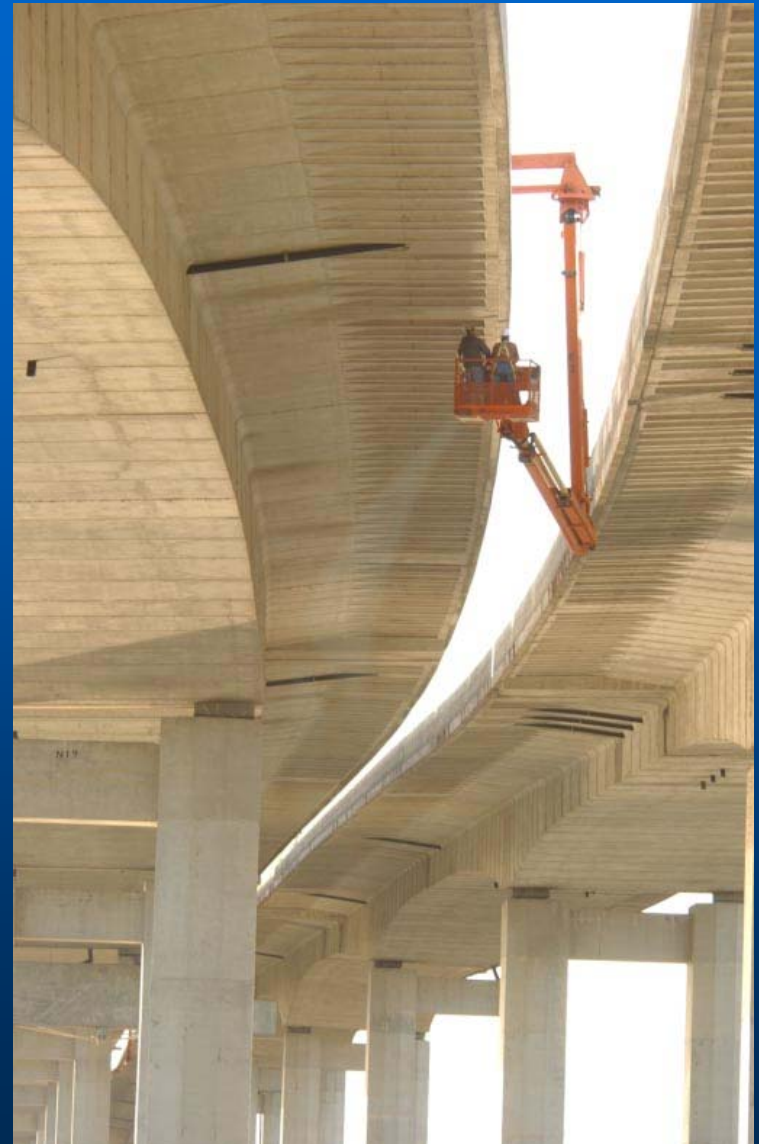


Performance Measures

- Difficulty defining “Good/Fair/Poor” to the public
- RSL is a technical measure of pavement performance
- Investigate development of a customer-oriented condition descriptor

Performance Measures

- Bridge ratings, both NBI and Pontis, are based upon visual inspections.
- Goals based upon condition ratings for major elements; deck, superstructure, and substructure.
 - If any of the 3 major elements are rated poor, the bridge is considered poor.



Pictures of Bridge Decks



Poor Bridge Deck



Good Bridge Deck

Pictures of Bridge Decks (From Underneath)



Poor Bridge Deck



Good Bridge Deck

Pictures of Bridge Superstructures (Beams)



Poor Bridge Beams



Good Bridge Beams

Pictures of Bridge Substructures



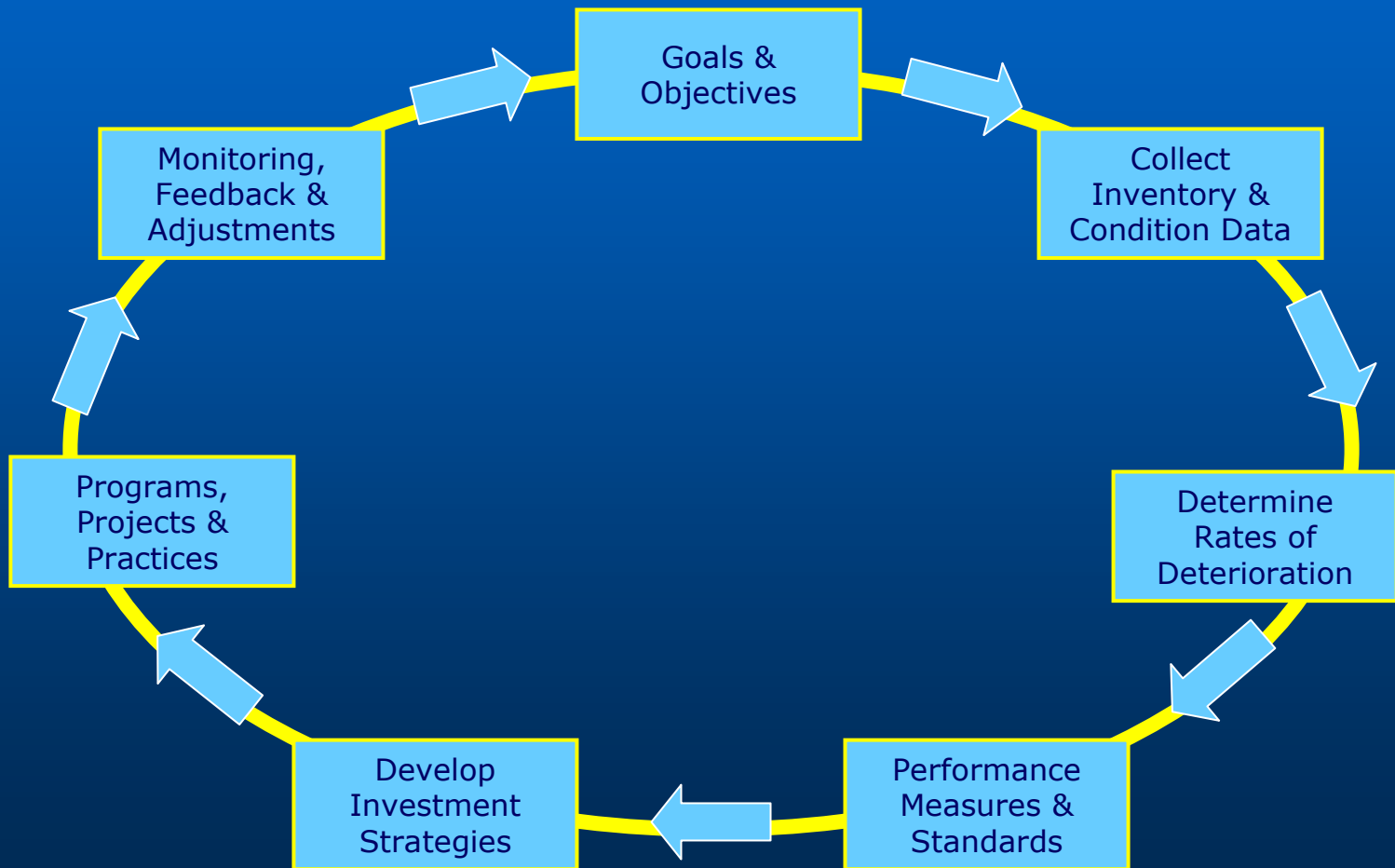
Poor Pier Column



Good Pier Column

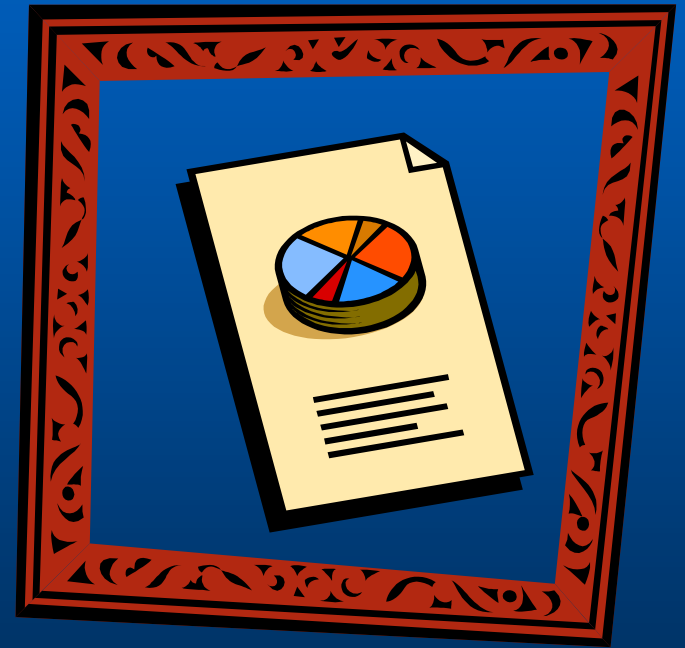
System Preservation

Developing Investment Strategies



Investment Strategies

- Road Quality Forecasting System (RQFS)
- Bridge Condition Forecasting System (BCFS)
- Alternatives Analysis
- Mix of Fixes
- Framework for Candidate Project Selection



Investment Strategies

Other Strategies & Considerations

- Corridor Approach



Investment Strategies

Other Strategies & Considerations

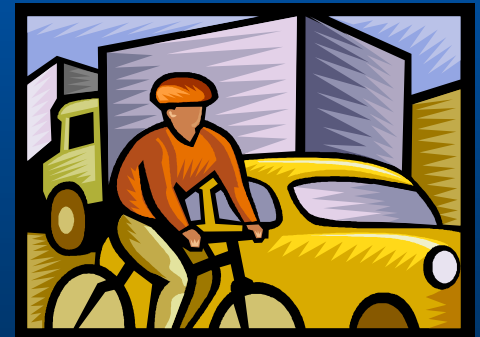
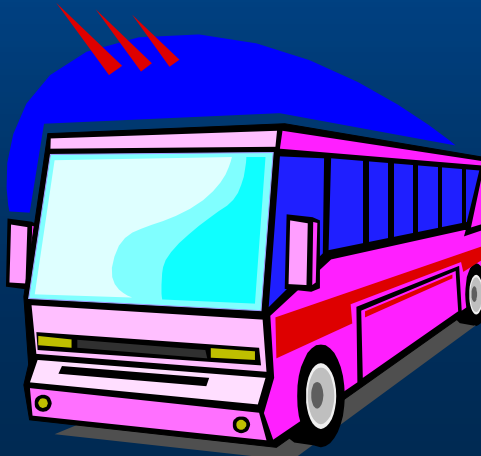
- Geographic Consideration
- Statewide Priorities Approach



Investment Strategies

Other Strategies & Considerations

- Multi-modal Considerations



Investment Strategies

Other Strategies & Considerations

- Safety Improvements



Investment Strategies

Other Strategies & Considerations

- Urban Fixes



Investment Strategies

Other Strategies & Considerations

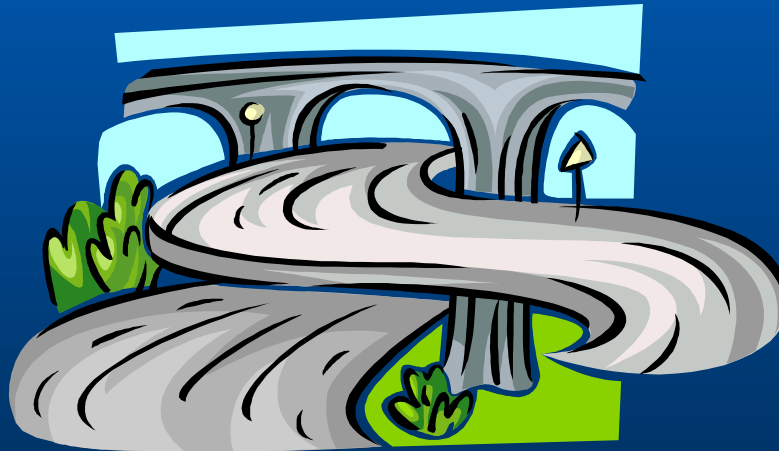
- Related Infrastructure Needs



Investment Strategies

Other Strategies & Considerations

- Modernization Requirements



Investment Strategies

Other Strategies & Considerations

- Context Sensitive Solutions
- Aesthetics and Roadsides



Investment Strategies

Other Strategies & Considerations

- Local/Metropolitan Planning Organization Priorities
- Stakeholder Considerations

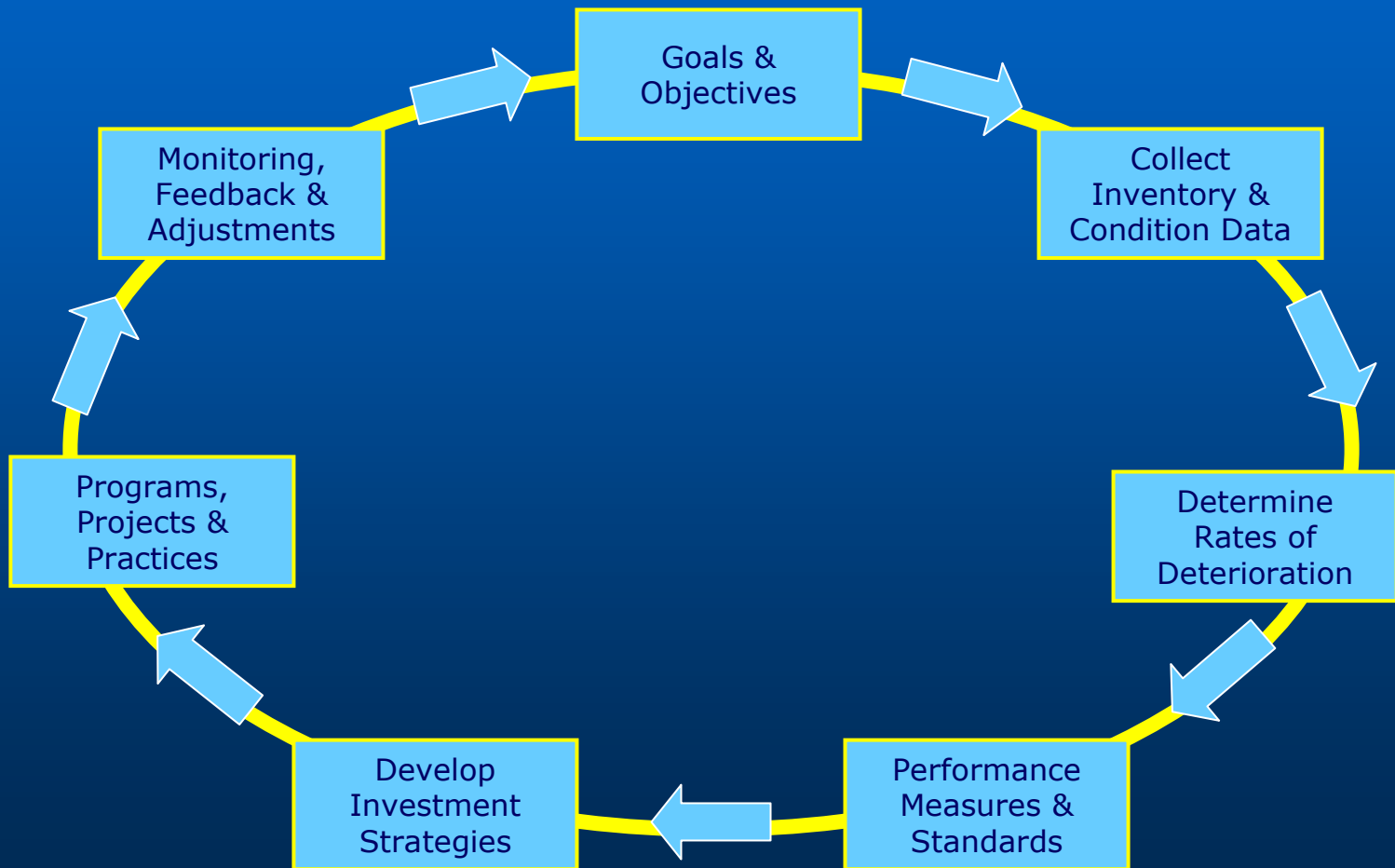


Investment Strategies Summary

- Corridor Approach
- Geographic Consideration/Statewide Priorities Approach
- Multi-modal Considerations
- Safety Improvements
- Urban Fixes
- Related Infrastructure Needs
- Modernization Requirements
- Aesthetics and Roadsides
- Context Sensitive Solutions
- Local/Metropolitan Planning Organization Priorities/Stakeholders

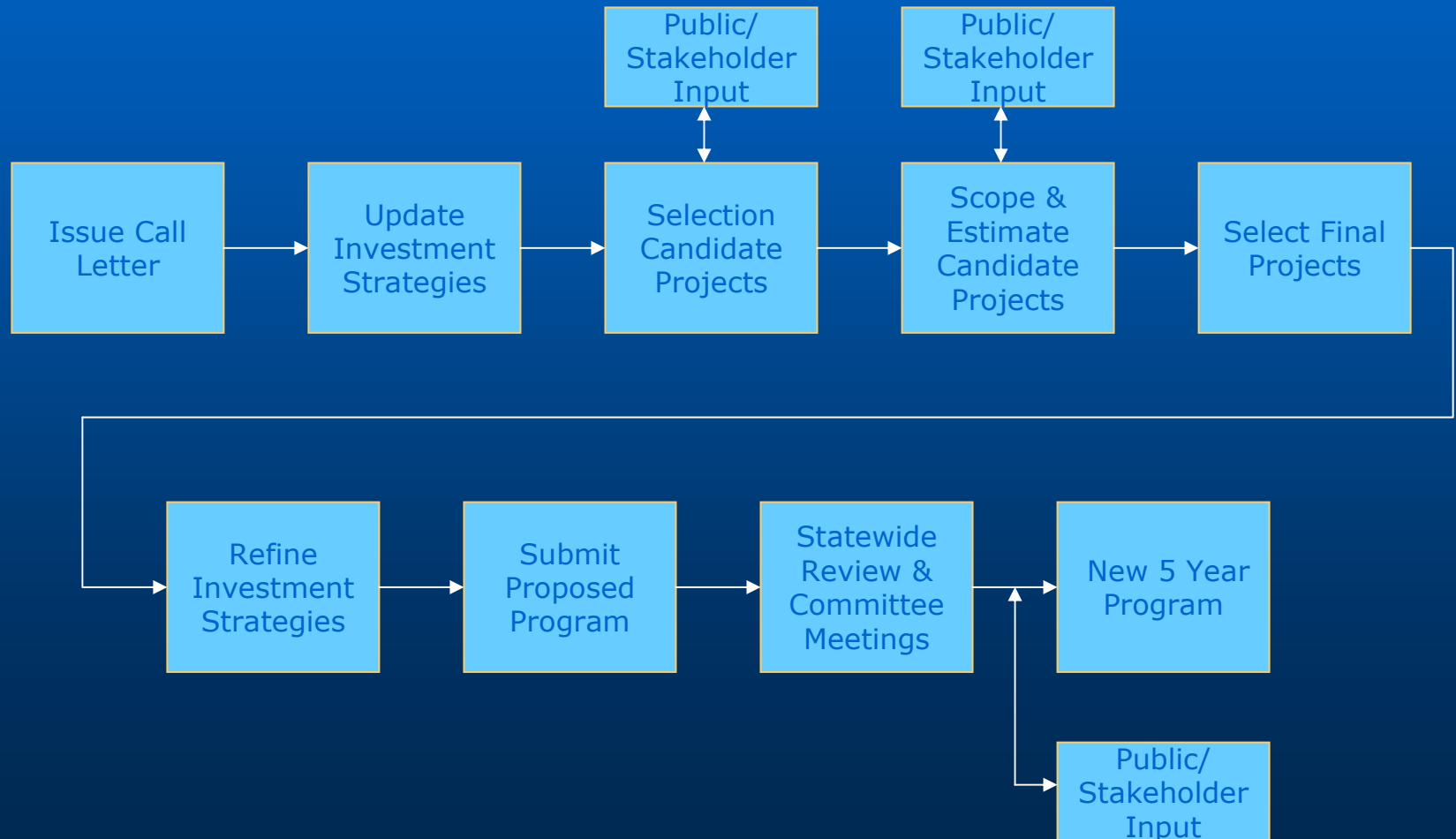
System Preservation

Programs, Projects & Practices



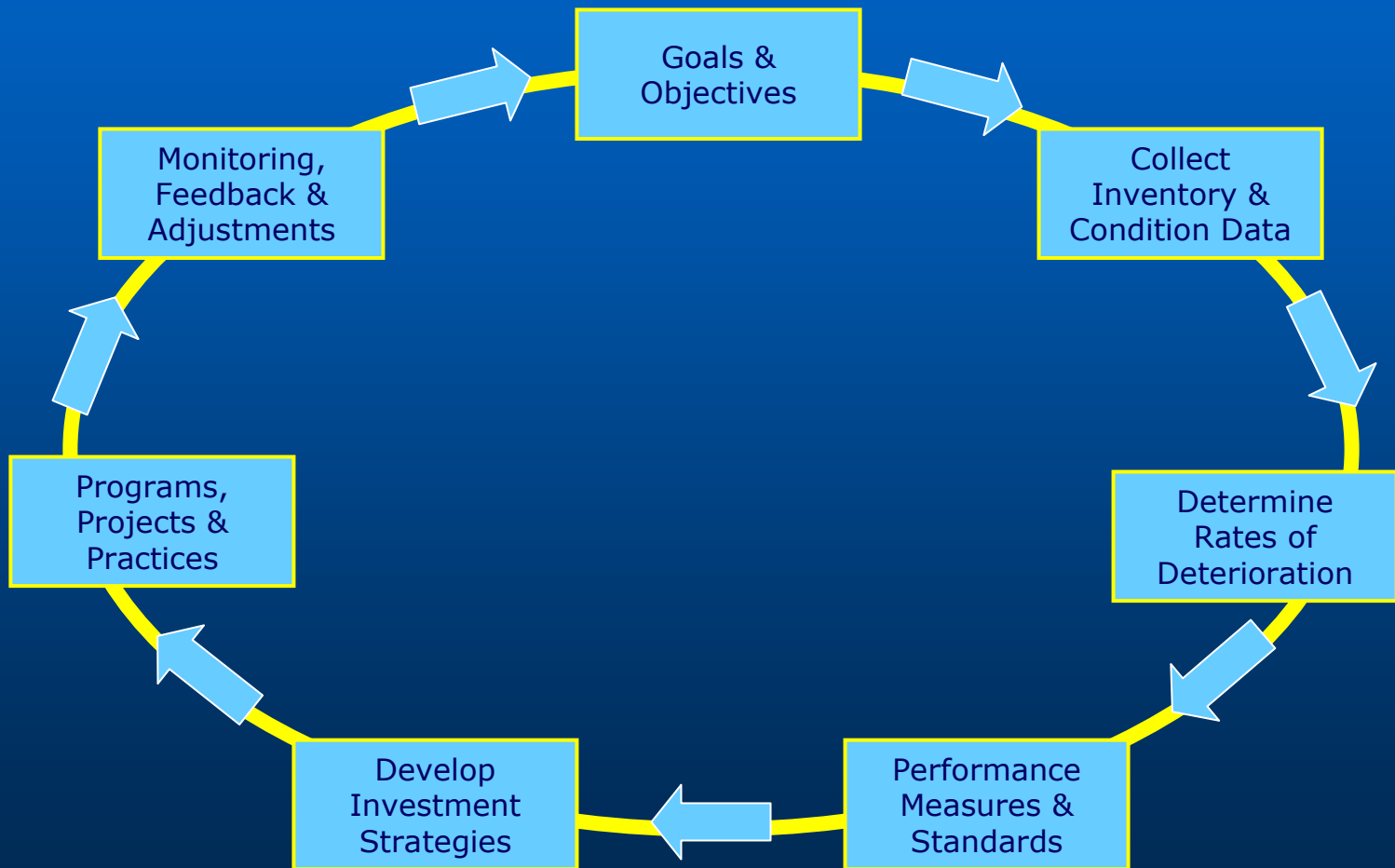
Implementing the Strategies Programs, Projects & Practices

Call for Projects Process



System Preservation

Adjusting Along the Way



Evolution of 2007 Pavement Condition Goal

- October 1997 – 85% good for the trunkline system (proposed goal) by 2007
- December 1997 – State Transportation Commission established two pavement condition goals to be achieved in 10 years
 - 95% good for Freeways
 - 85% good for the Non-Freeways
- MDOT has referred to the Freeway/Non-Freeway goal as 90% good.

Strategy and Funding Adjustments

- Annual Review of Fix Strategies with Regions
- Annual Review of Investment Strategies (Template)
 - a. Increased Preventive Maintenance
 - b. Implemented the Non-Freeway Resurfacing Program (NFRP)

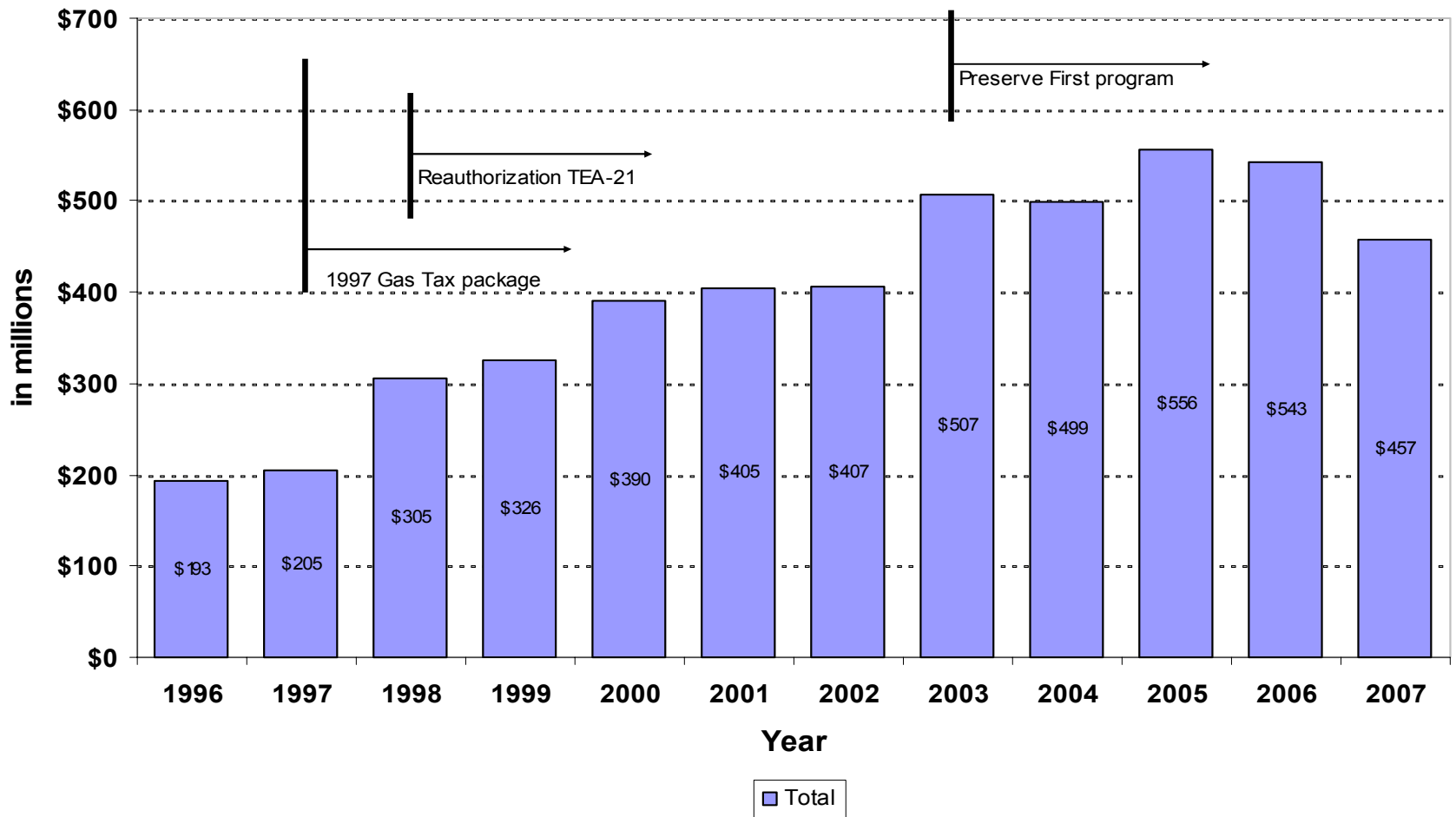


Strategy and Funding Adjustments

- Increase Preserve Funding to Account for Inflation
- Initiated Preserve First Program to increase emphasis on network preservation
- Federal bridge funds used for preventive maintenance activities

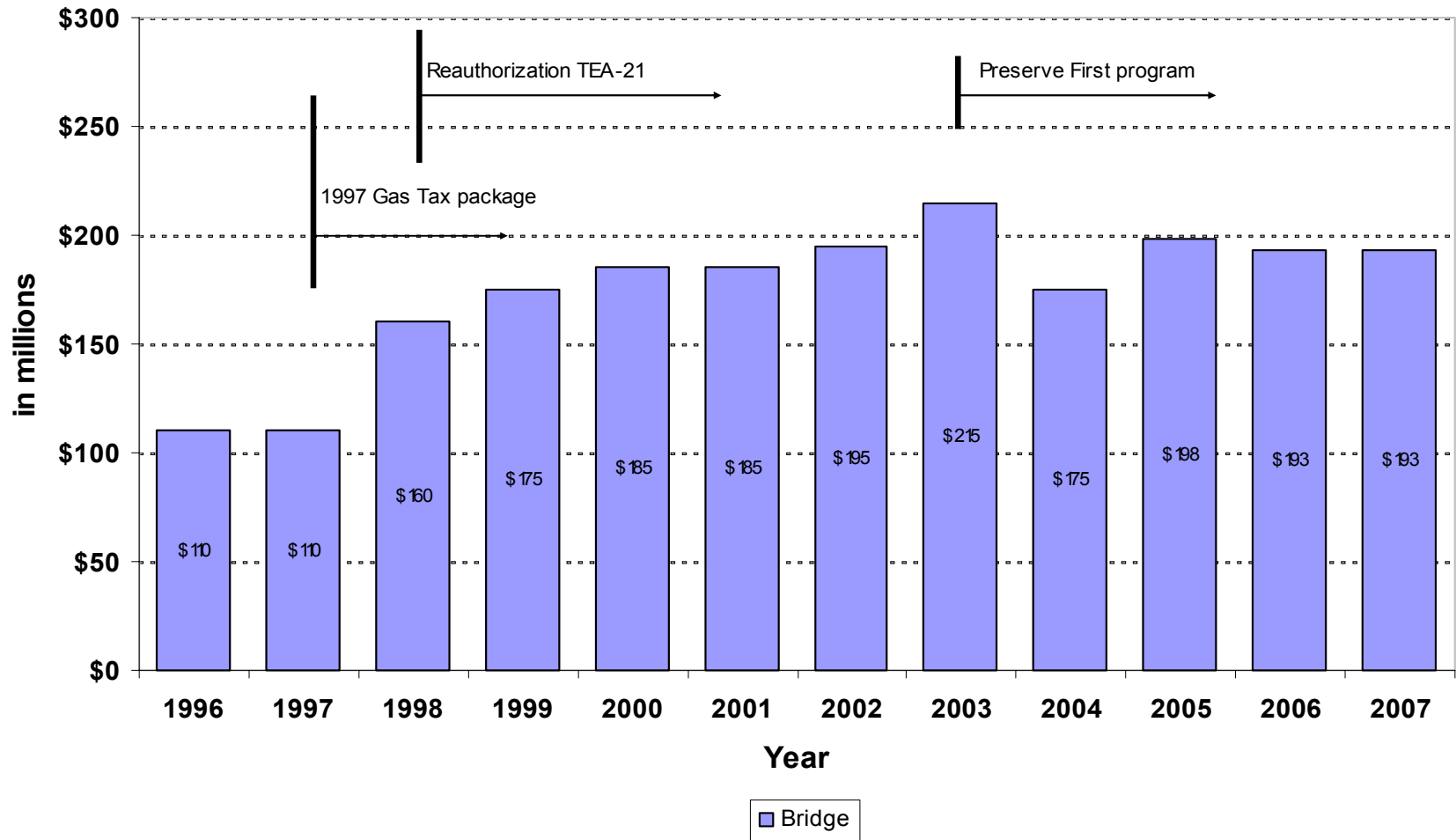


Pavement Preservation Funding Levels



- Includes road R&R, CPM and NFRP

Bridge Funding Levels



- Includes R&R, CPM, CSM
- 2003 –Includes addition of Rouge River Bridge project (\$26 Million)

Improvements to Data Collection

- Improved quality in pavement condition surveys
- Reduced the cycle time between data collection and data availability for both pavement and bridge

Improvements to Analytical Tools - Pavement

- Improved Input Data for RQFS Tool
 - Cost
 - Inflation
 - RSL
 - Fix Life
- Improved Strategy Analysis
 - Improving forecasting methodology (RQFS)
 - Standardized business practices
- Automation of Data Analysis
 - PaveMAPP



RQFS 2.1.Ink

Improvements to Bridge Analytical Tools

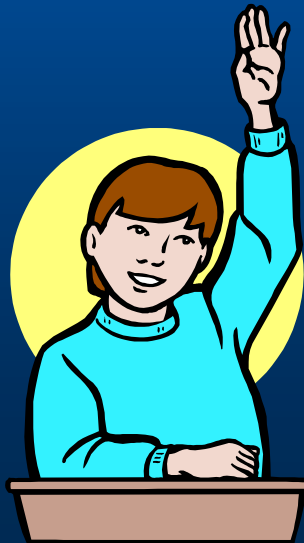
- Improved Input Data
 - Cost
 - Inflation
 - Fix Life
- Account for functional needs and other considerations
- Improved Performance Models



System Preservation



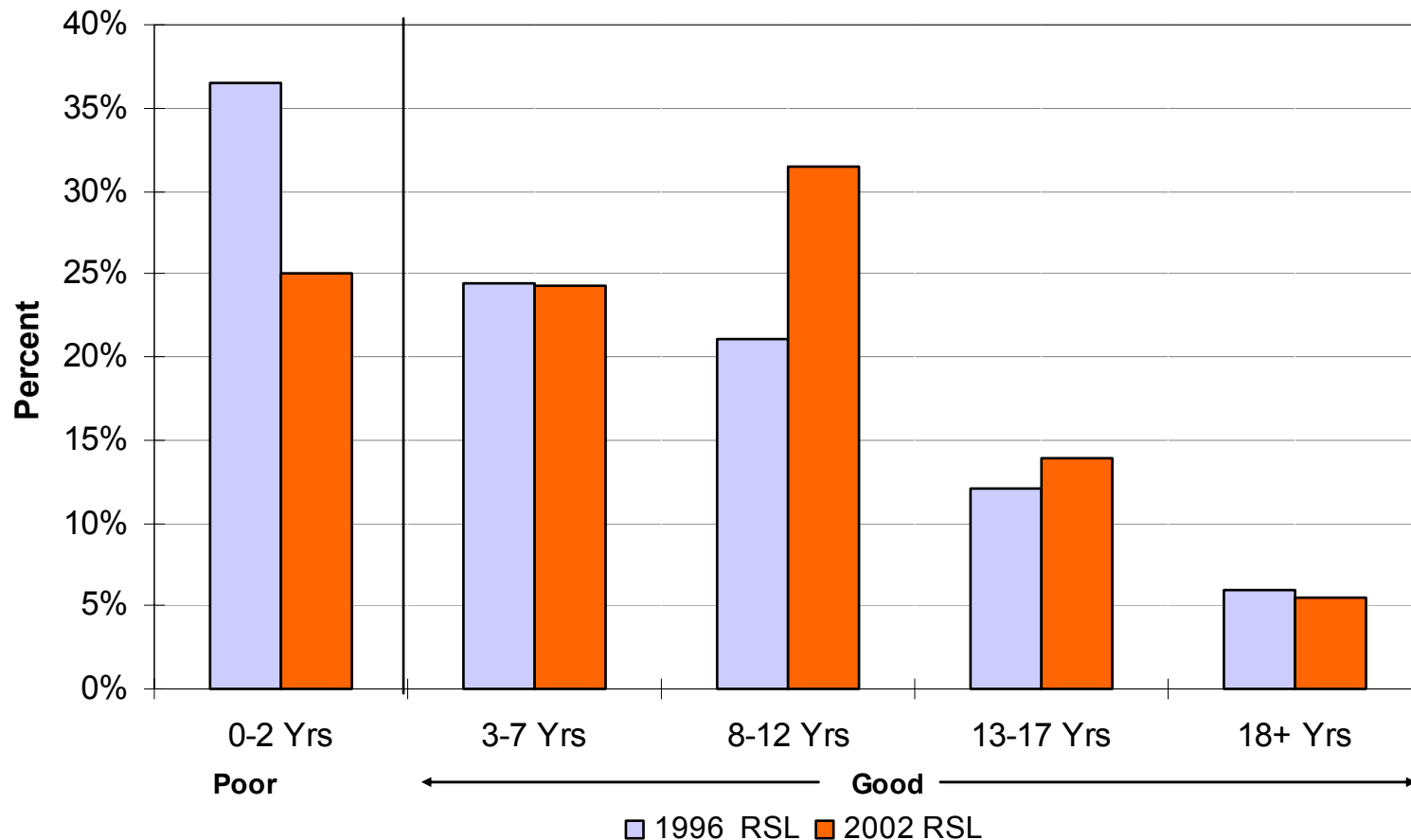
QUESTIONS?



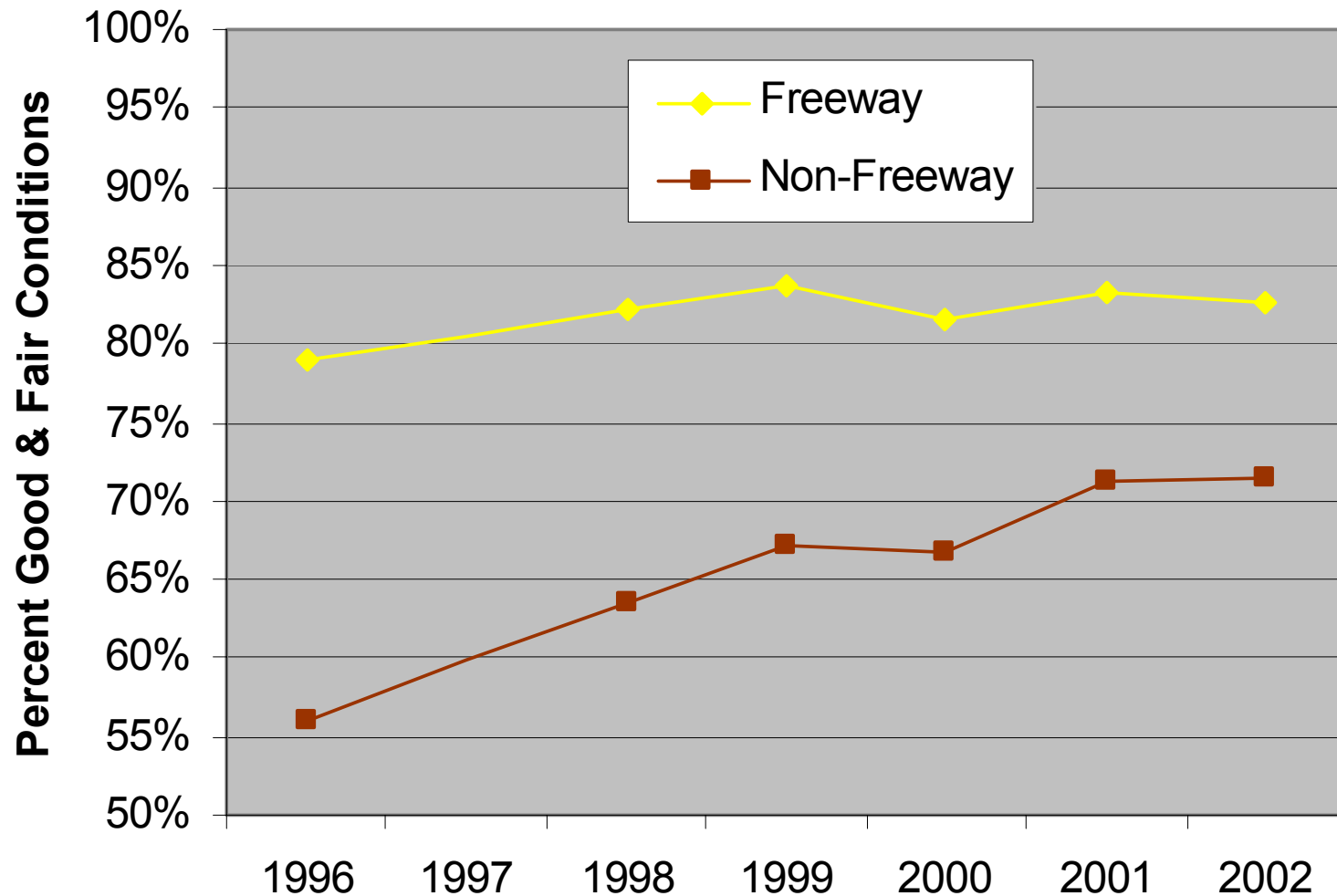
Pavement

- Network Health of Current System
- Current Condition Status
- 2007 Forecast
- Strategy Analysis
- 2004 Program Adjustment

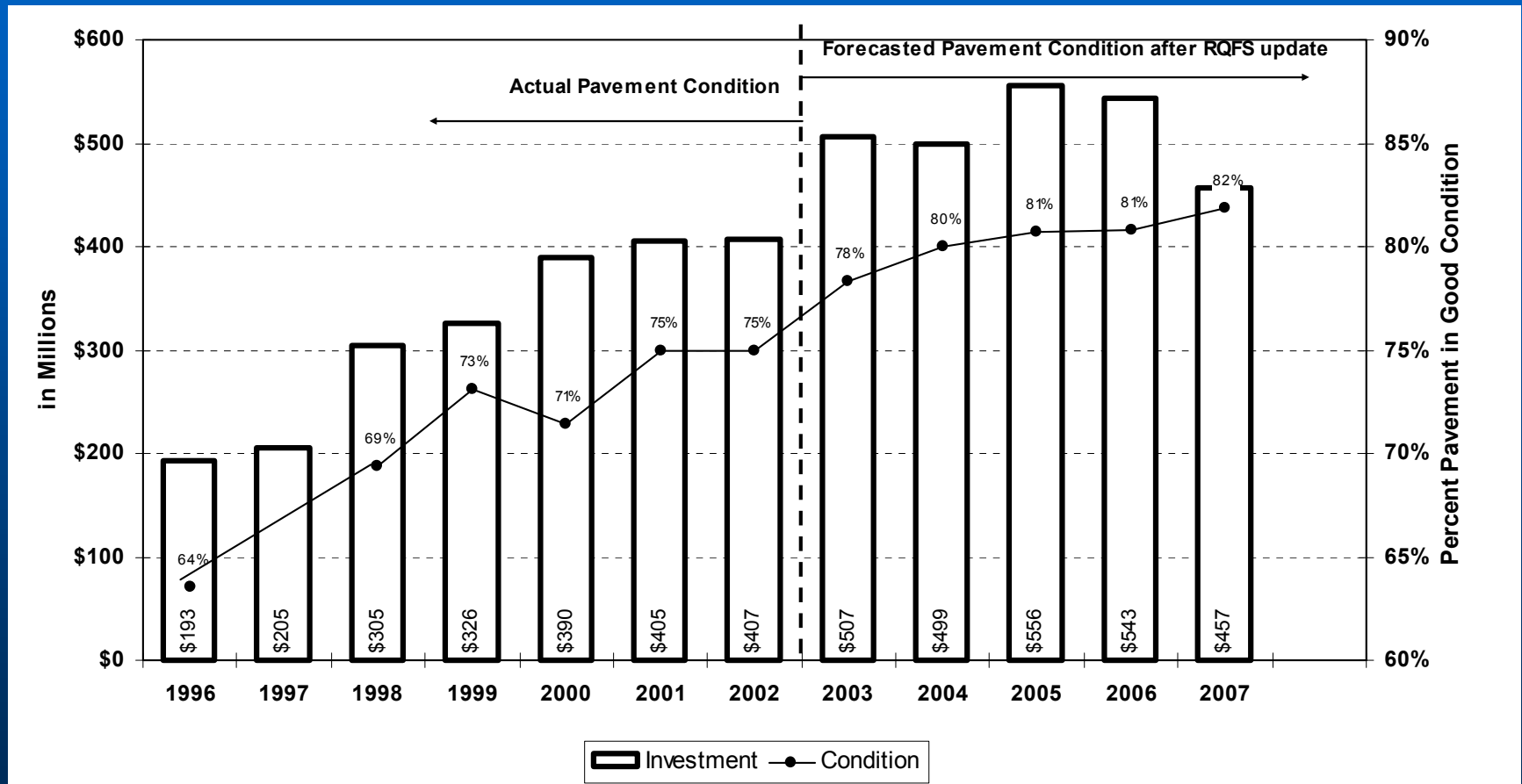
State Trunkline Roads Remaining Service Life Distribution (1996 vs. 2002)



Statewide Trunkline Pavement Condition History

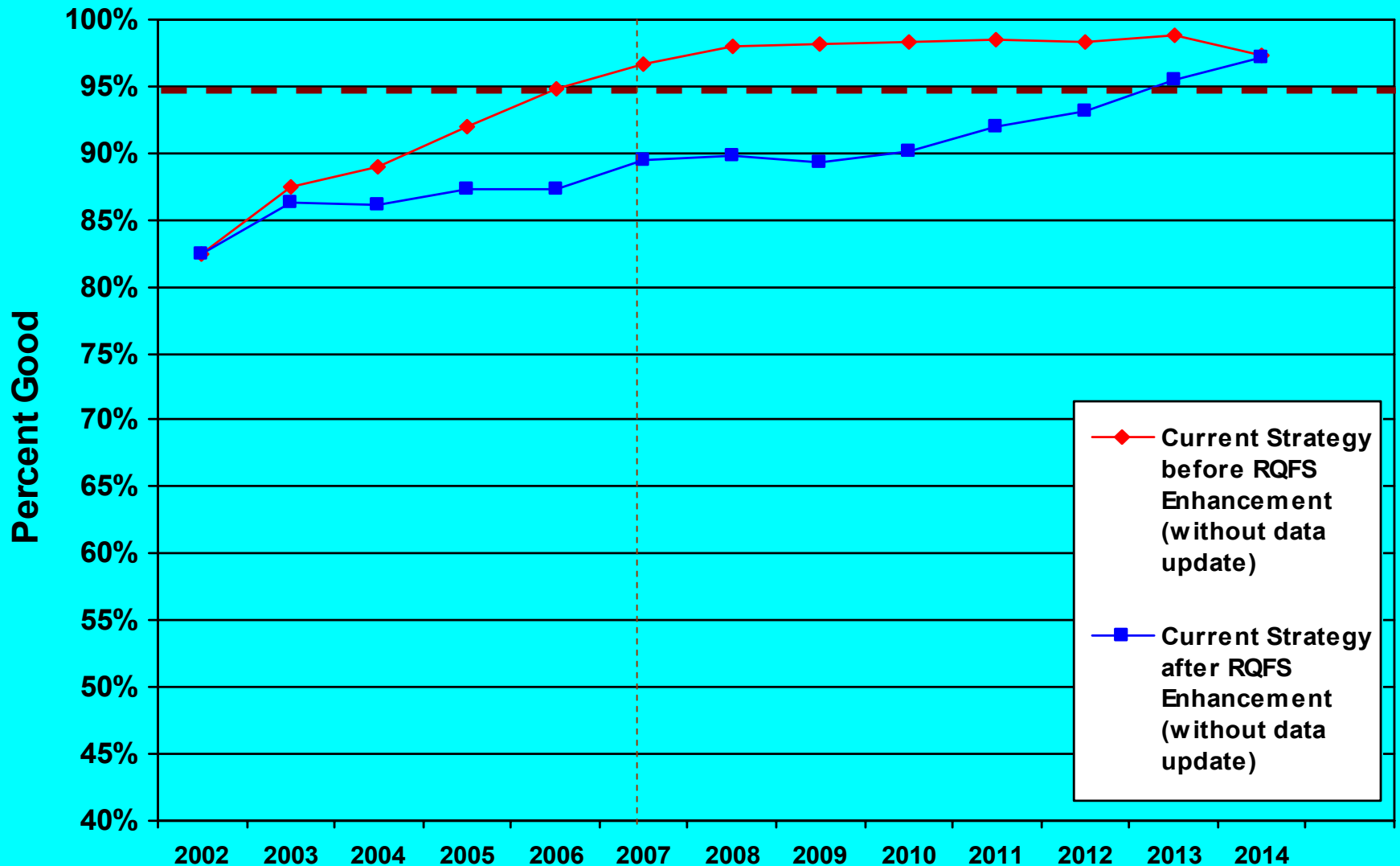


Road Preservation Investment Level and Pavement Condition (Freeway and Non-Freeway)

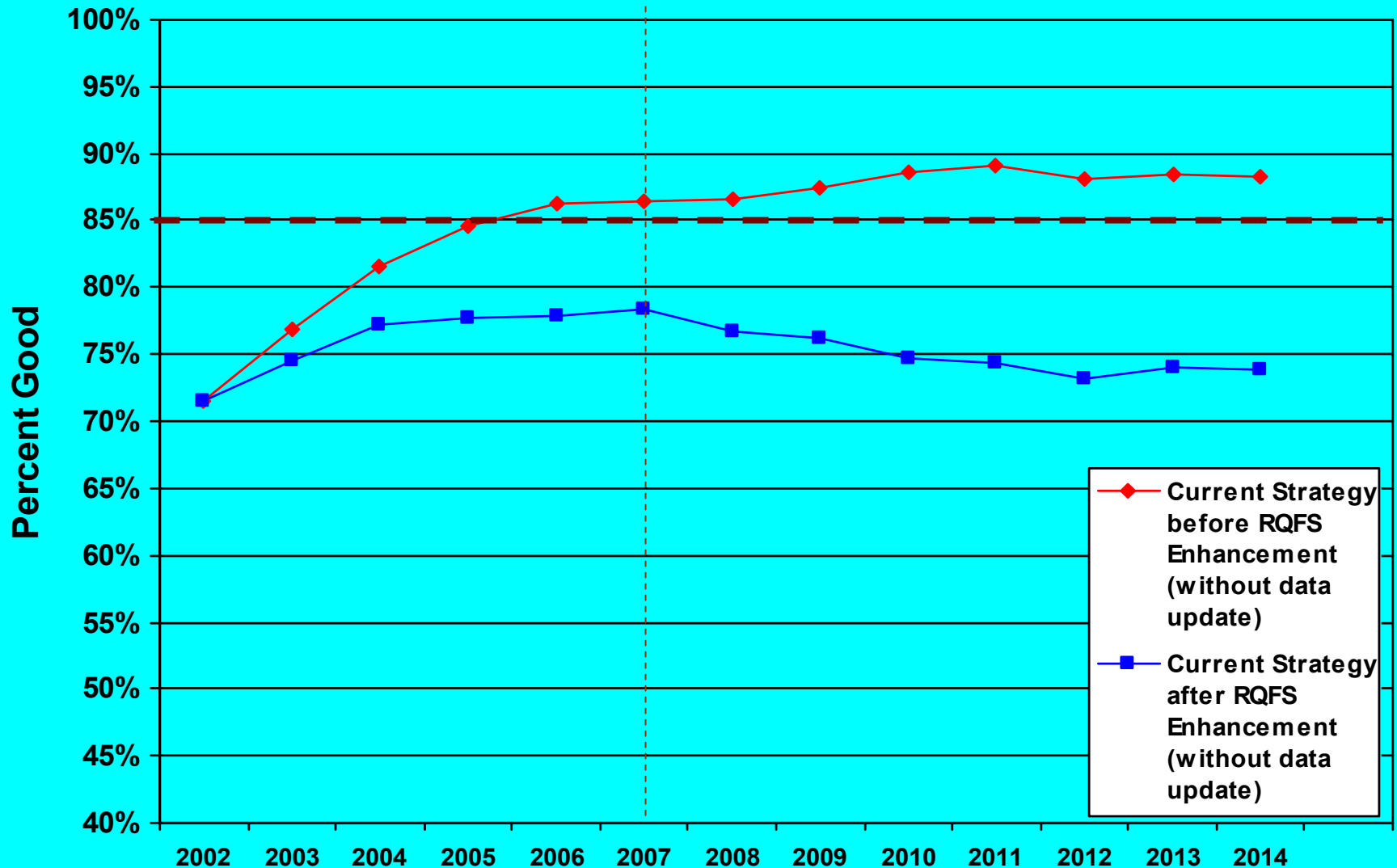


- Funding includes Road R&R, CPM, NFRP

Freeway Condition Forecast



Non-Freeway Condition Forecast



Why Progress Towards the Pavement Goal has Slowed

- Pavement preservation funding used to address non-pavement system needs
 - Ramps, service roads, lighting, pump houses
- Strategies adjusted to include overlooked necessities
 - Pavement reconstruction through small towns
- Project fix life variability
 - Pavement fixes not lasting as long as anticipated
- Some RQFS project cost estimates were underestimated
- RQFS forecasts prior to tool enhancement were optimistic

Strategy Analysis

- “What if” scenarios are being developed
- Alternatives will have a variety of mix-of-fixes
- Alternative analyses will consider:
 - Achieving and sustaining the goal
 - Long-term system health
 - Program costs
 - Determining acceptable traffic disruption
 - Impacts to the construction industry

2004 Program Recommendation

Pavement Preservation

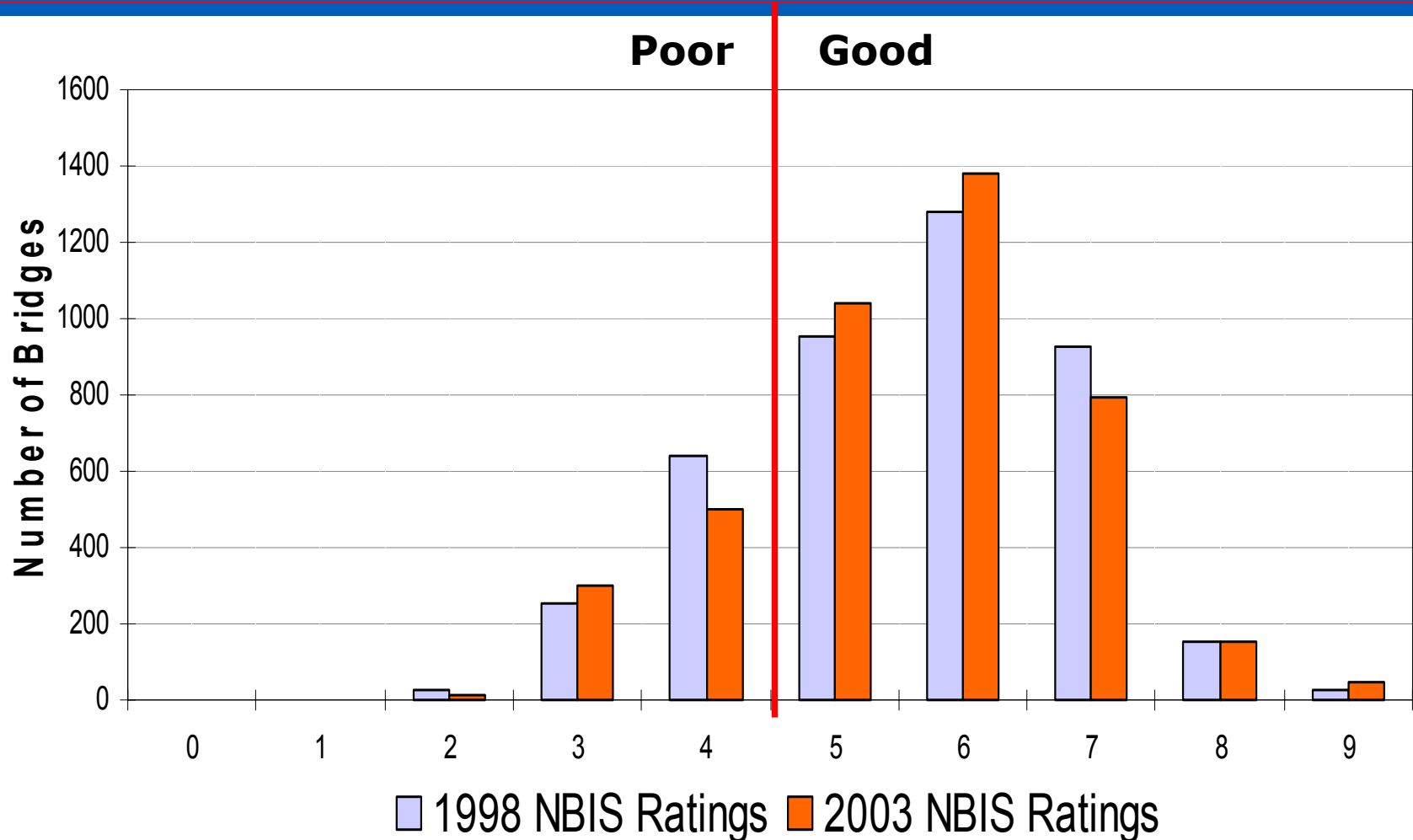
- In order to make better progress towards the pavement goal, we recommend adjusting the pavement preservation program
- We are reviewing the possibility of adding or advancing approximately \$50M - \$100M in road work in 2004
- We feel this is a prudent level of additional investment in light of the information at this time
- Final adjustments will be made when we have a reauthorization of the federal transportation bill

Bridge

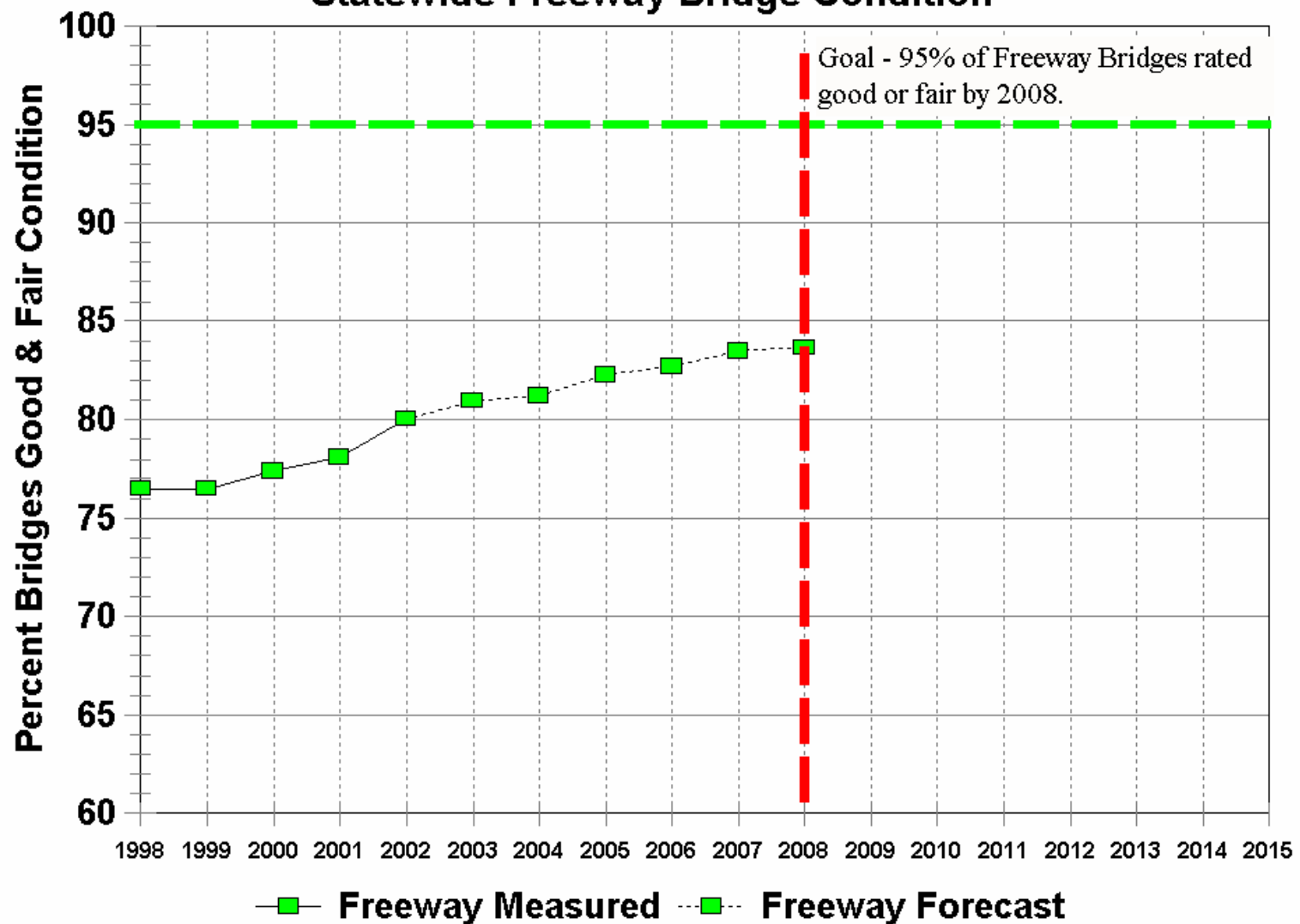
- Network Health of Current System
- Current Condition Status
- 2008 Forecast
- Strategy Analysis
- 2004 Program Adjustment



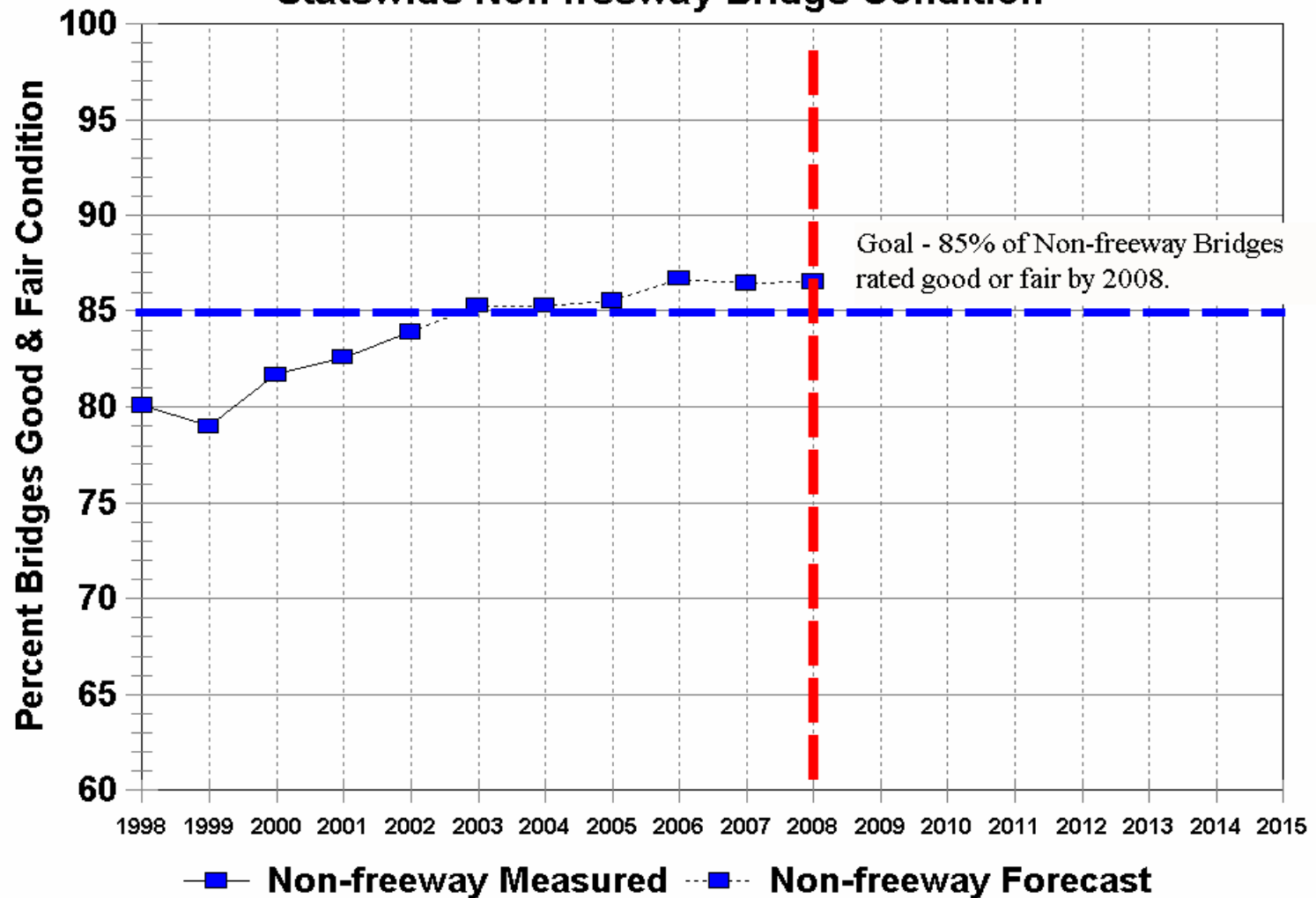
State Combined Freeway and Non-Freeway Bridges Condition Ratings



Statewide Freeway Bridge Condition

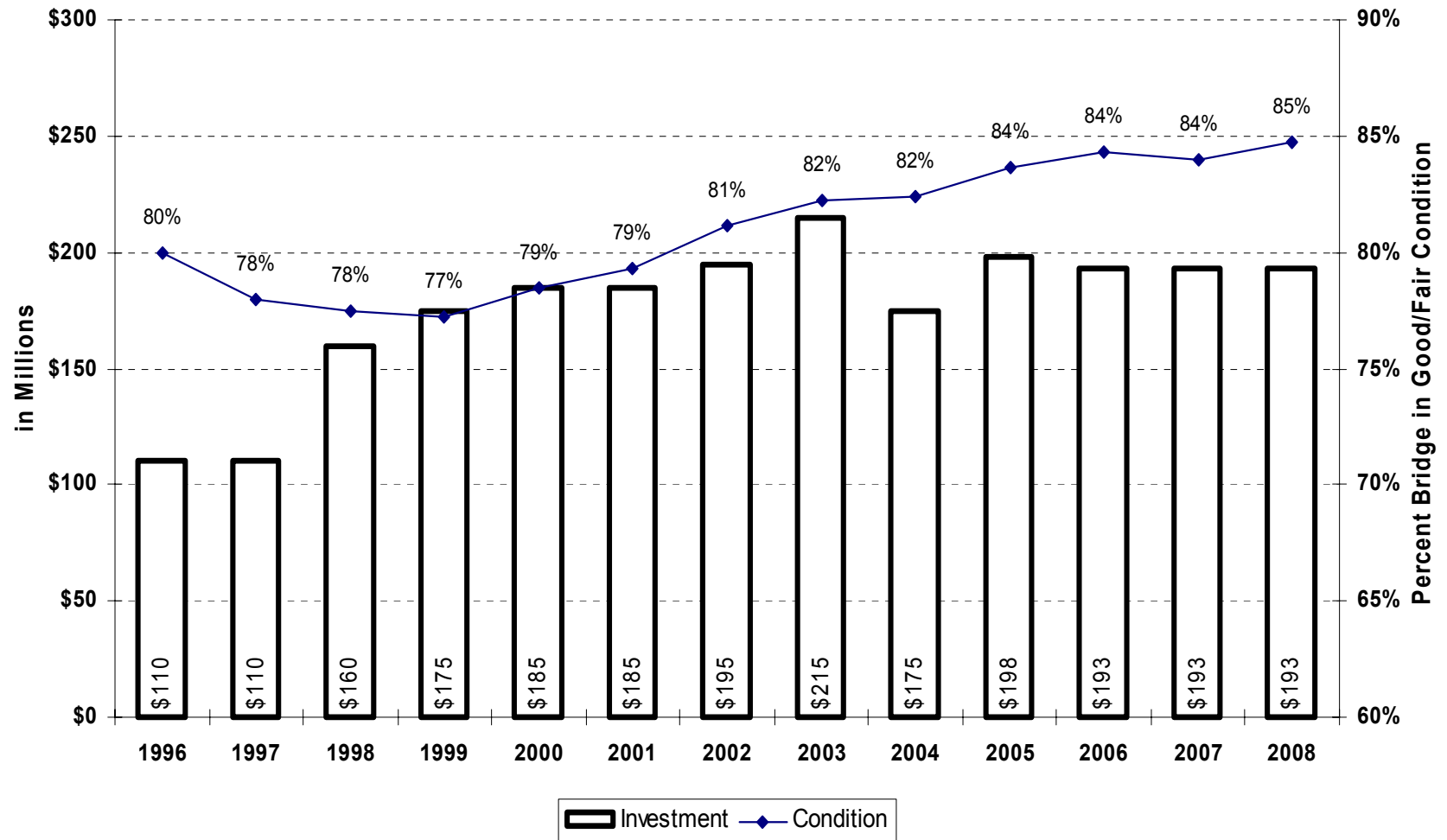


Statewide Non-freeway Bridge Condition



The Non-Freeway Bridge Goal Met in 2003.

Bridge Preservation Investment Level and Bridge Condition (Freeway and Non-Freeway)

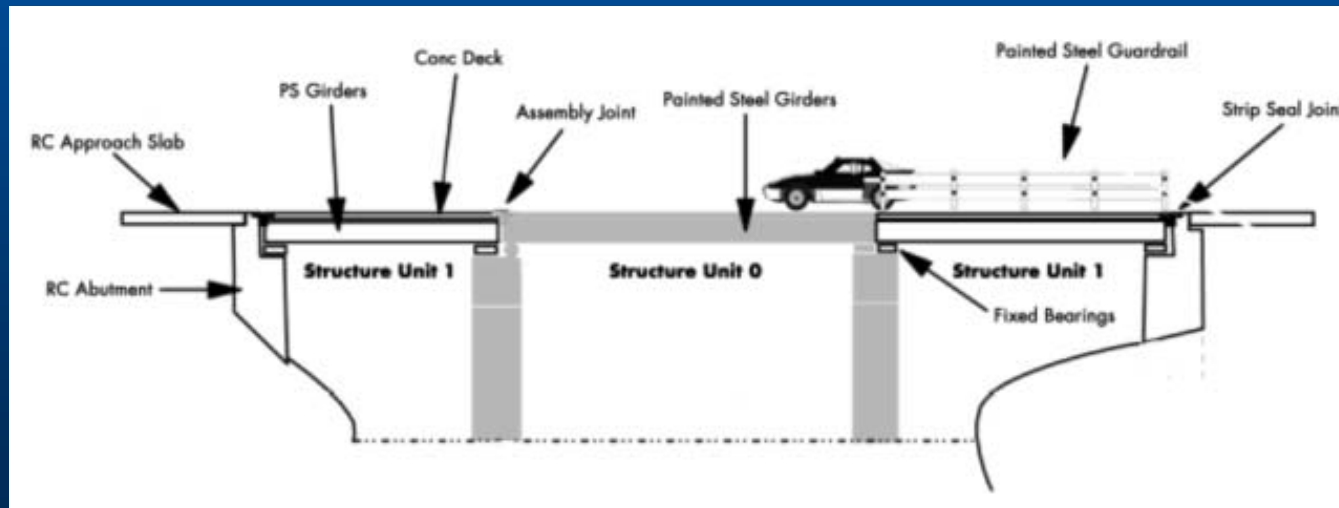


Why Progress Towards the Bridge Goal has Slowed

- Other non-highway bridge needs are being addressed
 - Pedestrian bridges, culverts 10 – 20 feet, railroad bridges
- Bridge functional needs
 - Widening, underclearance
- Don't always get credit for deck overlays.

Bridge Strategy Analysis

- “What if” scenarios are being developed
- We are continuing to evaluate our mix-of-fixes



2004 Program Recommendation

Bridge Preservation

- We have reached the non-freeway bridge goal
- In order to achieve the same outcome on the freeway system we recommend adjusting the freeway bridge preservation program
- We are reviewing the possibility of adding or advancing \$20M - \$30M in bridge work in 2004
- We feel this is a prudent level of investment in light of the information at this time
- Adjustments would be made when we have a reauthorization of the federal transportation bill

Conclusions

- We have achieved the non-freeway bridge goal early
- We remain committed to the pavement and bridge preservation goals
- We are also addressing other important infrastructure needs
- We have a technically sound process



Conclusions

- We have learned lessons along the way and are making improvements
- We are recommending a prudent investment adjustment to the 2004 program based on the information we have at this time
- This adjustment continues progress towards the road and bridge goals



Next Steps

- The Five Year Program to be presented December 11, 2003 will reflect our current strategy
- We will continue to monitor condition data and keep a pulse on Federal Reauthorization
- We plan to come back in Spring 2004 with the Five Year Program adjustment that reflects the recommendation and Federal Reauthorization dollars
- We will be developing a customer oriented descriptor for reporting pavement condition

